

# **DAIRY FOODS**

## **CAREER DEVELOPMENT EVENT**

### **Purpose**

This CDE is designed to assist students in gaining knowledge and understanding of important aspects of quality and marketing of milk and cheese.

### **Objectives**

Student should develop the following skills and abilities:

- I. Identify and estimate the intensity of 11 off-flavors that may occur in raw milk and associate the defects with cause and prevention.
- II. Identify each of 14 varieties of cheese.
- III. Identify defects in design and conditions of milking machines and relate these defects to milk quality, udder health, and milking efficiency.
- IV. Estimate amounts of sediment retained on cotton filters and interpret this to milk's quality.
- V. Estimate intensities of California mastitis test reactions and relate them to abnormal milk control.
- VI. Identify selected dairy foods and their substitutes (analogs).
- VII. Solve problems related to economics of milk production and marketing.
- VIII. Answer questions about milk marketing in Federal Order programs.

**DAIRY FOODS**  
**CAREER DEVELOPMENT EVENT**

Crosswalk with  
Show-Me Standards

Objectives – Students participating in the Career Development Event should be able to:		Show-Me Standards	
		Knowledge Standards (Content Areas)	Performance Standards (Goals)
1. Identify and estimate the intensity of 11 off-flavors that may occur in raw milk and associate the defects with cause and prevention.		MA.1  SC.3	1.3, 1.8  3.1, 3.5, 3.6, 3.8
2. Identify each of 14 varieties of cheese.		HP.3	4.4, 4.7, 4.8
3. Identify defects in design and conditions of milking machines and relate these defects to milk quality, udder health, and milking efficiency.			
4. Estimate amounts of sediment retained on cotton filters and interpret this to milk's quality.			
5. Estimate intensities of California mastitis test reactions and relate them to abnormal milk control.			
6. Identify selected dairy foods and their substitutes (analogs).			
7. Solve problems related to economics of milk production and marketing.			
8. Answer questions about milk marketing in Federal Order programs.			

**CORRESPONDING SECONDARY AGRICULTURE CURRICULUM**

<b>Course and/or Curriculum:</b>	Agricultural Science I Food Science and Technology	<b>Unit(s):</b>	Introduction to Animal Products Unit II – Food Processing Lesson 3 – Milk Processing Lesson 4 – Processing Dairy Products
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## **Event Format**

1. Fifty (50) multiple choice questions with 25 each on milk quality and marketing. Time: 36 minutes. Maximum points: 50.
2. Eight (8) milk samples to be evaluated using the California Mastitis Test method. Time: 18 minutes. Maximum points: 64.
3. Ten (10) cheese samples to be identified. Time: 12 minutes. Maximum points: 20.
4. Five (5) milker unit parts to be scored on defects present. Time: 18 minutes. Maximum points: 40.
5. Ten (10) milk samples to be scored on flavor (taste and odor). Time: 36 minutes. Maximum points: 120.
6. Problem solving areas to be divided in two parts:  
Part 1-- Five (5) samples for identification of real versus imitation dairy foods drawn from butter/margarine, whipped cream/non-dairy whipped topping, half and half/ liquid coffee whitener, cheese/cheese analog, other products for which there are substitutes. Time: 18 minutes. Maximum points: 20.  
Part 2-- Five (5) written problems testing knowledge of economics of milk production and marketing and milk's nutritional value. Emphasis on current issues. Time: 18 minutes. Maximum points: 20.
7. **Non-programmable calculators may be used in milk marketing problem solving only.** Calculators must be **nonprogrammable** and **non-graphing** models and limited to the following function keys or their equivalent: Plus (+); Minus (-); Multiplication (x); Division (/); Equals (=); Memory Clear (MRC); Memory Minus (M-); Memory Plus(M+); Plus &/or Minus (+/-); Percentage (%); Square Root or Square Keys. Additional Function Keys may be accepted if approved in advance by the CDE Superintendent. The main criteria is that the calculator be **nonprogrammable** & **non-graphing** and that equations &/or text may not be stored within the calculators memory.

## **Event Scoring**

### 1. MILK

	SCORES <sup>a</sup>		
OFF FLAVOR .....	S	D	P
Bitter .....	5	3	1
Feed.....	9	8	5
Flat/Watery .....	9	8	7
Foreign.....	5	3	1
Garlic/Onion.....	5	3	1
High Acid .....	3	1	<sup>b</sup>
Malty .....	5	3	1
Metallic/Oxidized .....	6	4	1
Rancid.....	4	1	—
Salty.....	8	6	4
Unclean.....	3	1	—

<sup>a</sup>Suggested scores are given for three intensities of flavors: S--slight, D--definite, P-- pronounced. Scores may range from 1 to 10. On a quality basis: 10 = excellent, 8 to 9 = good, 5 to 7 = fair, 2 to 4 = poor, and 1 =

unacceptable. Intermediate numbers may also be used; for example, a bitter sample of milk may score 4.

<sup>b</sup>Where a dash is entered, a product with an intensity of "off flavor" will not be used in the event.

## 2. CALIFORNIA MASTITIS TEST

<u>CMT Score</u>	<u>Test Appearance</u>	<u>Contestant Score</u>
Negative	Mixture liquid, no precipitate	0
T	Slight precipitate, tends to disappear with paddle movement	2
1	Distinct precipitate but does not gel	4
2	Distinct gel formation	6
3	Strong gel formation which tends to adhere to paddle. Forms distinct central peak.	8
Use only number 0, 2, 4, 6, and 8.		

## 3. MILKER UNIT PART CUTS

Rubber parts--dirty or milkstone .....	0.5
Rubber parts--checked or blistered.....	0.5
Rubber parts--leaky .....	0.5
Rubber parts--poorly fitted .....	0.5
Metal parts--dirty or milkstone .....	0.5
Metal parts--badly dented or damaged .....	0.5
Metal parts--pitted or corroded .....	0.5
Metal parts--open seam.....	0.5

Calculate score per sample as 4 - (number of defects x .5).

A combination of undesirable factors may score the milker unit zero.

## 4. IDENTIFICATION OF CHEESE

A score of two points is given for each variety incorrectly identified.

### Event Rules

1. Contestants will report for instructions to the Superintendent at the time and place shown in the Schedule of Events.
2. Contestants will be allowed three hours for the event with five segments being allotted 36 minutes each.  
NOTE: Milk marketing problem formulas will be provided.
3. The score made by each contestant is the number of points deducted; therefore, the lower score, the higher rating.

4. Milk samples will be scored using Form 3a. Samples will be prepared from pasteurized milk and will score 1-10. Contestants are to use whole numbers when scoring "Flavor" of milk. Check only the one most serious defect in a sample even if more than one flavor is detected. If no defect is noted, check "No Defect." Defects are worth two points each.
5. The California Mastitis Test will be scored using Form 3b. See scoring guide and references.
6. Milker units will be scored on Form 4a. The flexible plastic parts are to be scored as rubber parts, and rigid plastic or glass parts are to be scored as metal parts. Contestants will be permitted to bring and use flashlights.
7. Cheese samples for identification will be selected from those listed on the answer sheet, Form 4b. Cubes of cheese will be available for tasting.
8. Grade differences are determined on each form by difference between the Official Score and the Contestant's Score.

### **References**

Milk Facts (updated annually) available from Milk Industry Foundation, 1250 H St., NW, Suite 900, Washington, D.C. 20005; Phone: 202-737-4332; Use previous year's issue.

Questions and Answers on Federal Milk Marketing Orders, USDA, Agricultural and Marketing Service, Bulletin AMS 559. Latest edition, Washington, DC 20250. Farmers Bulletin 2259, Judging and Scoring Milk and Cheese, Dairy Division, AMS, United States Department of Agriculture, Washington, DC 20250, Phone: (202) 447-7473.

Science and Technology Guide, Using the California Mastitis Test, Cooperative Extension Service, University of Missouri, Columbia, MO 65211.

California Mastitis Test can be ordered from NASCO, catalog number C6059N. Toll free 1-800-558-9595 (Wisconsin, 1-800-242-9587). NASCO, 901 Janesville Avenue, Fort Atkinson, WI 53538.

USDA Government web sites:

Federal Milk Marketing Orders <http://www.ams.usda.gov/dairy/index> (click *Federal Milk Marketing Orders*, additional useful references on cheese is available by clicking *How to Buy Dairy Products* then *Cheese*).

Judging and Scoring Milk and Cheese <http://www.ams.usda.gov/dairy/judgscor.pdf>

Dairy Product-related Publications <http://www.ams.usda.gov/dairy/dypubs.htm>

10-4170-A Dairy Foods: Producing the Best (IML 2005) PDF on CD-ROM. Industrial Materials Lab <http://www.iml.missouri.edu>

**DAIRY FOODS CDE**  
**Milk Flavor**

Name: \_\_\_\_\_ Contestant No: \_\_\_\_\_

School: \_\_\_\_\_ School No: \_\_\_\_\_

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted and in proper sample column. DO NOT WRITE in space indicating official score, grade difference, grade on defects, rubber parts, and metal parts.

Perfect Score	Defects	Sample Number										Total Grades
		1	2	3	4	5	6	7	8	9	10	
Milk Flavor  No Defect 10 points	Contestant's Score											
	Official Score											
	Grade Difference											
	Grade on Defects											
	Bitter											
	Feed											
	Flat-watery											
	Foreign											
	Garlic or Onion											
	High Acid											
	Malty											
	Metallic/Oxidized											
	Rancid											
	Salty											
	Unclean											
	No Defect											
	TOTAL											

**DAIRY FOODS CDE  
CMT**

Name: \_\_\_\_\_ Contestant No: \_\_\_\_\_

School: \_\_\_\_\_ School No: \_\_\_\_\_

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted and in proper sample column. DO NOT WRITE in space indicating official score, grade difference, grade on defects, rubber parts, and metal parts.

Perfect Score	Defects	Sample Number								Total Grades
		1	2	3	4	5	6	7	8	
California Mastitis Test (CMT) 8 pts.	Contestant's Score									
	Official Score									
	Grade Difference									
		TOTAL								

**DAIRY FOODS CDE  
Milker Units**

Name: \_\_\_\_\_ Contestant No: \_\_\_\_\_

School: \_\_\_\_\_ School No: \_\_\_\_\_

Perfect Score	Defects	Sample Number					Total Grades
		1	2	3	4	5	
<b>Milker Unit</b>  No Defect 4 points  (defects valued at 0.5 points each)							
	Contestant's Score						
	Official Score						
	Grade Difference						
	Grade on Defects						
	Rubber Parts						
	dirty or milkstone						
	checked or blistered						
	leaky						
	poorly fitted						
	Metal Parts						
	dirty or milkstone						
	badly dented/damaged						
	pitted or corroded						
	open seams						
	<b>TOTAL</b>						

**DAIRY FOODS CDE**  
**Cheese Identification**

Name: \_\_\_\_\_ Contestant No: \_\_\_\_\_

School: \_\_\_\_\_ School No: \_\_\_\_\_

	Varieties	Sample Number										Total Grades
		1	2	3	4	5	6	7	8	9	10	
Identification of Cheese (Incorrect Identification 2 points ea.)	Grade on Identification*											
	1. Blue											
	2. Brick											
	3. Brie/Camembert											
	4. Cheddar (mild)											
	5. Cheddar (sharp)											
	6. Colby											
	7. Cream/Neufchatel											
	8. Edam/Gouda											
	9. Monterey (Jack)											
	10. Mozzarella											
	11. Muenster											
	12. Processed American											
	13. Provolone											
	14. Swiss											
	TOTAL											